

REMARKS

Claims 1-14 are pending the application. Claims 1-14 are rejected. New claims 15-24 have been added. No new matter has been added. Reconsideration is respectfully requested.

Claim Rejections - 35 U.S.C. § 102

Claims 1-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lomet et al. (U.S. Patent No. 5,485,607).

Claim 1

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131. Applicant respectfully submits that there are elements in the rejected claims which are not set forth in Lomet, therefore the rejections are believed unwarranted.

However, claim 1 has been amended to further clarify the patentable subject matter. Claim 1 now specifies the first locking mode when first held on the data item determines an associated set of predetermined access restrictions for the data item and determines an associated different set of predetermined access restrictions for the neighborhood associated with the data item. Claim 1 also specifies the second locking mode when first held on the neighborhood determines the associated set of predetermined access restrictions for the neighborhood and determines the associated different set of predetermined access restrictions for the data item.

This is clearly described in the specification at page 8, starting at line 4, and is also shown in FIGS. 7 and 8. For example, as described in FIG. 8 according to the table in FIG. 7, a first Sn lock transaction 50 on a data item C, allows a second Xnei lock mode for the insert transaction 52 for the free space associated with data item C. Similarly, as also shown in FIG. 7, if a Xnei lock mode is specified for the neighborhood associated with data item C, then a Sn lock mode would be allowed for subsequent transactions directed specifically to data item C. Conversely, a Xnei lock mode assigned by a first transaction to the free space neighborhood associated with data item C would create a second associated lock mode

restriction that would prevent a second transaction from assigning a S lock mode to data item C.

This locking scheme allows a first locking mode to be assigned to either a data item or its associated neighborhood, and then accordingly assign applicable different locking modes to the corresponding data item or neighborhood.

Lomet

Lomet does not describe a neighborhood locking system that restricts subsequent locking modes according to whether the data item or the associated neighborhood is already locked. Conversely, Lomet describes a locking system for dynamically redefining lockable ranges as key values are added and removed so that currently existing key values bound the currently lockable ranges. (Col. 10, lines 2-5).

The Examiner refers to Lomet at column 9, lines 42-45 which states: “The inserting transaction requests only an instant lock on k_{i+1} because there is no reason why one transaction’s insertion of k_i should prevent another transaction access to k_{i+1} ”. The Examiner then suggests that k_{i+1} is the tuple associated with the neighborhood, and as said in the reference, there is no reason for having to prevent access to it.

However, there are reasons for preventing a transaction from accessing k_{i+1} when another transaction is accessing k_i . (Refer to page 8 and FIG. 7 in the present application) Accordingly, as specified in claim 1, a first lock mode assigned to a data item also restricts which second different lock mode can be assigned to the neighborhood associated with the data item.

Lomet specifically teaches away from these limitations. There is no suggestion in Lomet of assigning a first locking mode to a first data item and then having that first locking mode determine what other locking modes can be assigned to the associated neighborhood by a second transaction. Lomet simply prevents a same lock mode assigned to k_{i+1} from also being assigned to k_i . Nowhere does Lomet suggest that a particular lock mode assigned to k_{i+1} also restricts what different particular lock modes can be assigned to k_i as specified in claim 1.

When referring to FIG. 6, at column 8, line 56, Lomet states that the ARIES/KVL operation does not separately lock key values and key ranges and that FIG. 6 only shows the lock modes that would be required in the ARIES/KVL system. Nowhere does Lomet suggest that a first lock mode assigned to a data item restricts or controls what lock modes are available to the associated neighborhood for the data item as specified in claim 1.

Claim 10

Claim 10 recites providing a first set of access privileges for to a first transaction accessing the data item and holding a lock mode on the data item corresponding with the first transaction; and providing a second set of access privileges to a second transaction operating independently of the first transaction and accessing for the neighborhood associated with the data item, the second set of access privileges determined by the lock mode already held on the data item by the first transaction.

Lomet specifically teaches away from claim 10. For example, when discussing the IIn lock, Lomet states that first there is a determination of whether the range has a conflicting lock. If another transaction currently holds a lock on anything in the range k_1 to k_{i+1} , including k_{i+1} , the IIn lock is unable to modify anything in the range and the insertion can not take place. (Col. 13 ln. 46-50). In other words, Lomet does not allow a first transaction to lock a data item and then allow a second independent transaction to access the neighborhood associated with the locked data item as specified in claim 10.

Claims 2, 6 & 7

Claim 2 has also been further amended to clarify a specific embodiment where the locking scheme allows a non-serializable scan of the data item with a first transaction while allowing a concurrent non-serializable lock on the neighborhood with a second transaction;

allows a serializable scan of the data item with the first transaction while preventing a concurrent non-serializable lock on the neighborhood with the second transaction;

allows a non-serializable lock on the neighborhood with the first transaction while allowing a concurrent non-serializable scan on the data item with the second transaction; and

allows a non-serializable lock on the neighborhood with the first transaction while preventing a concurrent serializable scan on the data item with the second transaction.

This is also clearly shown in FIG. 7.

Conversely, Lomet does not even differentiate serialized and non-serialized transactions for data items and associated neighborhoods.

Claim 6 specifies an (Xnei) mode that enables a first transaction to lock the neighborhood for inserting a new tuple but *prevents* the first transaction from locking a tuple associated with the neighborhood.

The Examiner rejected claim 6 pointing to Col. 9 lines 42-45. However, that very paragraph states that there is an instant lock on the data item. Allowing an instant lock, no matter how short a duration, does not prevent a lock as specified in claim 6.

Claim 7 recites a database management system...wherein the Xnei mode enables a second concurrent transaction to modify the tuple while preventing the second concurrent transaction from having exclusive rights on the neighborhood.

The Examiner rejects this pointing to Col. 9 lines 33-39 which discusses, first, inserting a k_{i+1} record, and then afterward inserting a k_i' record, where k_i' would have been in the k_{i+1} neighborhood. It is clear that Lomet is not doing anything concurrently in this example. Further, it is clear that no lock is allowing the modification of k_{i+1} (which examiner asserts is the tuple for this case) while preventing the very transaction modifying k_{i+1} from modifying the neighborhood (which would have to be k_i' in examiner's example).

Therefore Lomet does not teach a mode that enables a concurrent transaction to modify both the tuple while concurrently preventing the transaction from taking exclusive rights on the neighborhood. Similar arguments are applicable to claims 8-9.


For the reasons stated above, claims 1-9 are allowable under 35 U.S.C. § 102(b) over Lomet et al. (U.S. Patent No. 5,485,607). Claims 10-22 are allowable for the some of the same reasons

CONCLUSION

For at least the foregoing reasons, reconsideration and allowance of claims 1-18 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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